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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,467	07/20/2005	Yuri A. Dubitsky	05788.0335-00000	8438
22852	7590	07/10/2009	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			ONIHL, KARIE AMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/518,467	<b>Applicant(s)</b> DUBITSKY ET AL.
	<b>Examiner</b> Karie O'Neill	<b>Art Unit</b> 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 09 April 2009.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 53-104 is/are pending in the application.  
 4a) Of the above claim(s) 72-104 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 53-71 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 22 December 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/95/08)  
 Paper No(s)/Mail Date 12-22-04.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group I (claims 53-71) in the reply filed on April 9, 2009, is acknowledged. The traversal is on the ground(s) that "the Examiner has not shown that examining Groups I-III together would constitute a serious burden, irrespective of whether or not they relate to a single general inventive concept...as required by MPEP 803." This is not found persuasive because the restriction shows three different inventions that imparts a serious burden on the examiner for examination of multiple inventions. Further, burden does not need to be established under PCT Rule 13.1. The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-52 have been cancelled. Claims 53-104 have been added as new. Claims 72-104 have been withdrawn from consideration as being drawn to non-elected groups. Therefore, Claims 53-71 are pending in this office action.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) or (f), which papers have been placed of record in the file.

***Information Disclosure Statement***

4. Information disclosure statement (IDS), submitted December 22, 2004, has been received and considered by the examiner.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 53-71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what components are included when calculating the cell resistance value of the fuel cell. For example, the cell resistance may be calculated by just measuring the ohmic resistance of the membrane. It may be calculated by measuring the ohmic resistance of the anode, cathode and electrolyte components together. It can also be calculated by including components such as separator, bipolar or end plates. It is unclear if the cell resistance value is for one unit cell or for a fuel cell stack, and if it is a fuel cell stack, how many number of fuel cell units makes up the stack.

7. Claim 58 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what "an oxygen bridge" is or how something is "grafted to the polyolefin through an oxygen bridge".

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 53-60 and 62-71 are rejected under 35 U.S.C. 102(b) as being anticipated by Scherer et al. (US 5,656,386).

With regard to Claims 53-57, Scherer et al. discloses a fuel cell comprising an anode (2a), a cathode (2b) and a polymer electrolyte membrane (4) placed between the anode (2a) and the cathode (2b). Scherer et al. discloses the membrane (4) comprising a base polymer, selected from the groups formed by substituted and un-substituted polyolefins, which is radiation grafted with terminally sulfonated radicals derived from vinyl monomers which are selected from the group formed by substituted and un-substituted vinyl monomers (see abstract). Scherer et al. discloses an operating temperature of the fuel cell being up to approximately 80°C (column 5 lines 10-11) and the ohmic loss due to membrane resistance rises by less than 100mV over a period of approximately 1000 hours at a current density of approximately 1 A/cm<sup>2</sup>. This is equal to a membrane resistance rise by less than 0.1 Ωcm<sup>2</sup>. Scherer et al. does not specifically disclose a value of cell resistance at 90°C not higher than 0.3 Ωcm<sup>2</sup> and a value of cell resistance at 20°C differing from the value of cell resistance at 90°C in an amount not higher than 90% with respect to the value of cell resistance at 90°C. Scherer et al. also does not disclose wherein the value of cell resistance at 90°C is between 0.02 Ωcm<sup>2</sup> and 0.25 Ωcm<sup>2</sup>; wherein the value of cell resistance at 90°C is between 0.05 Ωcm<sup>2</sup> and 0.20 Ωcm<sup>2</sup>; wherein the value of cell resistance at 20°C differs from the value of cell resistance at 90°C in an amount not higher than 70% with respect to the value of cell resistance at 90°C; and wherein the value of cell resistance at 20°C

differs from the value of cell resistance at 90°C in an amount not higher than 50% with respect to the value of cell resistance at 90°C. However, such properties are inherent, given that both Scherer et al. and the instant application utilize the same materials. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference.

See MPEP 2112.

With regard to Claim 58, Scherer et al. discloses wherein the side chains are grafted to the polyolefin through an oxygen bridge. Example 1 discloses the use of benzene as the grafting material (column 8 line 1).

With regard to Claims 59-60, Scherer et al. discloses the amount of grafting of the side chains to be in a range of 15 to 45% by weight (column 3 lines 65-67).

With regard to Claim 62, Scherer et al. disclose wherein the fuel cell is a hydrogen fuel cell (column 6 lines 63-67).

With regard to Claims 63-65, Scherer et al. discloses wherein the polyolefin selected from the group consisting of polyethylene and various other substituted and un-substituted polyolefins (column 3 lines 29-30 and 46-53). Scherer et al. discloses the use of low density polyethylene (column 3 lines 2-6).

With regard to Claims 66-69, Scherer et al. discloses wherein the side chains are selected from any hydrocarbon polymer chain which contains proton conductive functional groups or which may be modified to provide proton conductive functional groups and wherein the side chains are of unsaturated hydrocarbon monomers, such as styrene,  $\alpha$ -methylstyrene,  $\alpha$ -fluorostyrene and para-chloromethylstyrene (column 3 lines

53-55). With regard to Claims 70 and 71, Scherer et al. discloses wherein the proton conductive functional groups are selected from sulfonic acid groups of, for example, chlorosulphonic acid (Example 1).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scherer et al. (US 5,656,386), as applied to Claims 53-60 and 62-71 above, and in further view of Ehrenberg et al. (US 5,679,482).

Scherer et al. discloses the fuel cell in paragraph 9 above, but does not disclose wherein the fuel cell is a direct methanol fuel cell.

Ehrenberg et al. discloses an ion conducting membrane comprising poly(alpha-olefins), polydienes, and hydrogenated derivatives of polydienes, and the ion-conducting domain is provided by a component chosen from the group consisting of the sulfonic acids of polystyrene and poly(alpha-methylstyrene (column 3 lines 46-51) for use in a direct methanol fuel cell (column 12 lines 8-9). It would have been obvious to one of ordinary skill in the art to use a direct methanol fuel cell as the fuel cell of Scherer et al., because Ehrenberg et al. teaches that one key factor in the performance of a direct methanol fuel cell is the ability of the membrane to absorb water in order to

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conduct protons, yet not absorb and allow the significant transport of methanol (column 12 lines 10-15).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/  
Primary Examiner, Art Unit 1795

Karie O'Neill  
Examiner  
Art Unit 1795

KAO